IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s):	Drissi et al.
Docket No.:	YOR920000401US1
Serial No.:	09/713,342
Filing Date:	November 14, 2000
Group:	2129
Examiner:	Wilbert L. Starks
Title:	Method and Apparatus for Generating a Data Classification Model Using an Adaptive Learning Algorithm

---

REPLY BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellants hereby submit a duplicate reply to the Examiner's (duplicate) Answer, mailed October 22, 2007 (referred to hereinafter as "the Examiner's Answer"), in an Appeal of the final rejection of claims 1-23 in the above-identified patent application. This Reply Brief is substantively the same as the Reply Brief submitted on September 27, 2006.

REAL PARTY IN INTEREST

A statement identifying the real party in interest is contained in Appellants' Appeal Brief.

RELATED APPEALS AND INTERFERENCES

A statement identifying related appeals is contained in Appellants' Appeal Brief.

STATUS OF CLAIMS

A statement identifying the status of the claims is contained in Appellants' Appeal Brief.

STATUS OF AMENDMENTS

A statement identifying the status of the amendments is contained in Appellants' Appeal Brief.

SUMMARY OF CLAIMED SUBJECT MATTER

A Summary of the Invention is contained in Appellants' Appeal Brief.

STATEMENT OF GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A statement identifying the grounds of rejection to be reviewed on appeal is contained in Appellants' Appeal Brief.

CLAIMS APPEALED

A copy of the appealed claims is contained in an Appendix of Appellants' Appeal Brief and the present Reply Brief.

ARGUMENT

Examiner's Answer: Argument 1

The Examiner indicates that the rejections of the claims are not withdrawn (under section 101) because there is ample precedent in case law to reject the claims. The Examiner presents cases that were considered in looking for statutory material and asserts that "Examiner finds no basis under any of these cases to find that the claims are statutory."

Appellants note that a determination that *certain case law* does not provide a basis for finding that claims are statutory does *not* mean that the claims are not statutory. The Examiner has not presented cases to support the argument that there is ample precedent in case law to *reject the claims*.

The Examiner also asserts that Appellant's argument regarding Diamond v.

Chakrabarty does not show how the cited case applies to the instant case and does not apply the law to the facts.

Appellants note that the argument cited by the Examiner continued as follows:

> In any event, the analysis does not stop there. The Supreme Court has stated that the "***[t]ransformation*** and reduction of an article 'to a different state or thing' is the clue to patentability of a process claim." *Gottshalk v. Benson*, 409 U.S. 63, 70, 175 U.S.P.Q. (BNA) 676 (1972). In other words, claims that require some kind of transformation of subject matter, which has been held to include intangible subject matter, such as data or signals that are representative of or constitute physical activity or objects, have been held to comply with Section 101. *See, for example, In re Warmerdam*, 31 U.S.P.Q.2d (BNA) 1754, 1759 n.5 (Fed. Cir. 1994) or *In re Schrader*, 22 F.3d 290, 295, 30 U.S.P.Q.2d (BNA) 1455, 1459 n.12 (Fed. Cir. 1994).
>
> Each independent claim includes at least one transformation. For example, independent claims 1, 16 and 22 **modify** the bias of one or more data classification models, based on a performance evaluation. Thus, a modified data classification model is provided. Claims 8, 21 and 23 **classify** objects and **select** a data classification model for classifying a domain dataset by comparing characteristics of the domain dataset to rules. Thus, an object classification is provided. Finally, claim 13 processes performance values for each combination of domain dataset and said bias to **adjust** one or more rules for subsequent data classification. Thus, adjusted rules are provided.

Thus, in light of the entire argument presented by Appellants, the cited quote regarding Diamond v. Chakrabarty is appropriate and applicable to the present case.

Examiner's Answer: Arguments 2-3

The Examiner asserts that the data Applicant discusses, in its broadest reasonable interpretation, includes purely mathematical data. The Examiner asserts that that interpretation makes it so that the claims have an interpretation where they are devoid of statutory matter. The Examiner further asserts that the word data is unlimited in practical application and asserts that, if pure mathematical algorithms are per se nonstatutory, how can mere data be statutory. Finally, the Examiner asserts that Applicant claims no limitation to any practical application in the real world.

Contrary to the Examiner's assertion, *the modified data classification model, object classification, and adjusted rules*, cited above are the result of the transformation of subject matter, which has been held to include intangible subject matter, such as data or signals

that are representative of or constitute physical activity or objects. *The modified data classification model, object classification, and adjusted rules* are useful for classifying data and thus, contrary to the Examiner's assertion, are limited to a practical application.

Regarding the Examiner's assertion that Applicant "asserts that the algorithmic manipulation of pure 'data' is statutory in 'Argument 2,'" Appellants could find no such assertion in Argument 2.

Regarding the Examiner's assertion that Applicant "admits he rests his argument on the algorithmic manipulation of these abstract ideas that are more abstract than pure mathematical data," Appellants could find no such admission in the Appeal Brief.

Regarding the Examiner's assertion that Applicant "did not identify what things he was evaluating the performance of" and notes that there must be limitations to real world applications, Appellants reiterate that *the modified data classification model, object classification, and adjusted rules* are limitations to real world applications.

Appellants submit that each of the claims are therefore in full compliance with 35 U.S.C. §101, and accordingly, respectfully request that the rejection under 35 U.S.C. §101 be withdrawn.

Examiner's Answer: Argument 4

The Examiner asserts that the "Applicant based his argument on narrower subsets of what is actually claimed, thereby presenting erroneously narrow claim interpretations that appear more acceptable than the ones drafted into the claims."

As noted above, Appellants reiterate that *the modified data classification model, object classification, and adjusted rules,* ***required by the independent claims of the present application,*** are limitations to real world applications.

Appellants submit that each of the claims are therefore in full compliance with 35 U.S.C. §101, and accordingly, respectfully request that the rejection under 35 U.S.C. §101 be withdrawn.

Examiner's Answer: 102/103 Arguments

The Examiner asserts that "Applicant uses inconsistent terminology and seems to

be confused by the inconsistencies in his own terminology."

A person of ordinary skill in the art would recognize that the terminology used by the Applicant is clear and consistent throughout the patent application and subsequent prosecution, as explained below.

Examiner's Answer: Metafeatures

The Examiner cites the definitions of various terms and asserts that the Examiner interprets Applicant's term "metafeatures" to mean "features about features."

Appellants note that the Examiner has failed to cite any well known definition of metafeatures. In the absence of such a definition, the Examiner has apparently attempted to derive an interpretation of the term "metafeatures" without any consideration of the patent application and the context of the present invention. In light of the present disclosure, a person of ordinary skill in the art would understand the meaning of the term "metafeature."

The Examiner further asserts that "Applicant seems to follow this convention in claim 1, but departs from it in claim 5 where he claims that the '…domain data set is represented using a set of met features.'" The Examiner further asserts that it is "Applicant's usage of terms that conflicts with convention and causes the inconsistency."

First, Appellants note that claim 1 requires a "meta-feature that characterizes said domain data set" and claim 5 requires "wherein said domain dataset is represented using a set of meta-features." Appellants find no inconsistency in these limitations and the associated definitions of the recited terms, as would be apparent to a person of ordinary skill in the art.

Regarding the Examiner's statement that Applicant's usage of the terms conflicts with convention, Appellants again note that the Examiner has failed to provide a *conventional* definition of the term "metafeature." While the Examiner may utilize the broadest reasonable interpretation of the claims, Appellants note that it is the Applicant, *not the Examiner*, who is free to be his own lexicographer.

Examiner's Answer: Domains

The Examiner notes that "Applicant then makes the statement that 'the features of the indexing terms taught by Lewis are not domain data sets'" and that "this problem is a result of Applicant's confusion regarding features and 'metafeatures.'"

Appellants reiterate that the features of the indexing terms taught by Lewis are ***not*** domain data sets and, while this statement may prove to be a problem for the validity of the rejection, Appellants do not view the statement itself as "a problem." Appellants find no confusion, lack of clarity, or inconsistency regarding the terms "features" and "metafeatures," as used in the present application.

The Examiner further asserts that "Lewis contains metafeatures that are features of 'indexing terms,' but the indexing terms are features of the data set classified by Lewis." The Examiner further asserts that, "regardless of how applicant interprets his claims, this prior art was selected to anticipate it."

To address this argument, Appellants would first like to briefly review a portion of Appellants' previous response regarding the section 102/103 rejections of the claims. In that response, Appellants argued that,

> thus, a person of ordinary skill in the art would recognize that the features of indexing terms taught by Lewis are ***not domain data sets***. Also, since neither McAulay nor Lewis disclose or suggest that features of indexing terms are domain datasets, ***a person of ordinary skill in the art would not look to combine McAulay and Lewis.***
>
> Also, as previously argued, Appellants note that Lewis teaches that "most current indexing languages represent documents as tuples or vectors of numeric or binary values, with *each value corresponding to an indexing term.*" (Page 38, Section 2.) Lewis then teaches that, "***for clarity***, we therefore call the features of indexing terms metafeatures." (Page 38, Section 2.2; emphasis added). *Metafeatures in Lewis are therefore features of indexing terms* (the individual values representing a document) and ***not domain datasets***.
>
> More importantly, Lewis does not disclose *selecting data classification models based on a meta-feature that characterizes a domain data set.* In addition, *since Lewis only discloses the use of one algorithm (the genetic algorithm), there is no selection of classification models.*

First, the Examiner appears to base his rejection primarily on the definition of metafeatures, without sufficiently addressing the other elements in Appellant's argument.

Second, regardless of how the Examiner utilizes the term metafeature in the context of the Lewis disclosure, a person of ordinary skill in the art would not interpret "features of indexing terms" as *metafeatures that characterize a domain data set.*

Third, the Examiner asserts that there is a standard understanding of

"metafeature" without establishing a standard meaning.

Finally, regarding the Examiner's assertion that the interpretation that a metafeature is a thing that represents a domain data set is anticipated by Lewis where it shows that the "metafeature" is a "feature" of the indexing terms, Appellants can find no credible reasoning to equate a "feature of the indexing terms" with a metafeature that ***represents*** *a domain data set.*

Examiner's Answer: Argument 5

The Examiner asserts that "the bottom line here is that Applicant misuses the word 'metafeatures' in claim 5 to represent a 'domain data set'" and asserts that "unless the claimed 'domain data set' is a set of features itself, Applicant's usage is a confusing misuse of the prefix 'meta.'"

Once again, Appellants maintain that the use of the term metafeature is clear and consistent throughout the patent application, including claims 1 and 5, and that metafeatures may ***represent*** a domain data set without requiring that the 'domain data set' be a set of features.

The Examiner further asserts that, "in short, either the 'metafeatures' in claims 1 and 5 are the same or different, either way, Applicant has made an error." The Examiner asserts that "if the 'metafeatures' are the same, then claim 5 is not further limiting of claim 1."

Appellants note that, in any case, claim 5 further limits claim 1, since claim 1 requires a "meta-feature that ***characterizes*** said domain data set" and claim 5 requires "wherein said domain dataset is ***represented*** using a set of meta-features."

Examiner's Answer: Arguments 6-7

The Examiner asserts that "Applicant presents two paragraph long sentences that make general denials of the rejections without referring to the specific rejections made by Examiner" and asserts that such arguments "are insufficient to show distinctions from the specific prior art."

Once again, the Examiner is commenting on a portion of the Appellant's argument without considering the overall context of the response. The paragraphs cited by the Examiner were presented to demonstrate that features that were ***not*** disclosed by the cited prior

art (as outlined in the earlier passages) were ***specifically*** *required by the claims of the present application*

Examiner's Answer: Arguments 8-9

Regarding the rejection of claims 3 and 18, Appellants reiterate that the Examiner has failed to establish that the cited prior art discloses or suggests generating one or more rules, *each of said rules specifying one or more characteristics of said domain datasets and a* ***corresponding bias*** *that should be utilized in one of said data classification models*. Appellants can find no such disclosure in the cited art.

Regarding the rejection of claims 4 and 19, Appellants reiterate that the Examiner has failed to establish that McAulay discloses or suggests the step of selecting a data classification model for ***classifying a domain dataset by comparing characteristics of said domain dataset to said rules***. Appellants can find no such disclosure in the cited art.

Conclusion

The rejections of the cited claims under §101 and under §102 and §103 in view of McAulay et al. or Lewis, alone or in any combination, are therefore believed to be improper and should be withdrawn. The remaining rejected dependent claims are believed allowable for at least the reasons identified above with respect to the independent claims.

The attention of the Examiner and the Appeal Board to this matter is appreciated.

Respectfully,

Date: December 18, 2007

Kevin M. Mason
Attorney for Applicant(s)
Reg. No. 36,597
Ryan, Mason & Lewis, LLP
1300 Post Road, Suite 205
Fairfield, CT 06824
(203) 255-6560

APPENDIX

1. A method for classifying data, comprising the steps of:

classifying objects in a domain dataset using one or more data classification models, each of said one or more data classification models having a bias;

selecting at least one of said one or more data classification models based on a meta-feature that characterizes said domain data set;

evaluating the performance of said classifying step; and

modifying said bias based on said performance evaluation.

2. The method of claim 1, wherein said steps of classifying and evaluating are performed for a plurality of said domain datasets and wherein said method further comprising the steps of recording a performance value for each combination of said domain datasets and said bias.

3. The method of claim 2, further comprising the step of processing said recorded performance values for each combination of said domain datasets and said bias to generate one or more rules, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models.

4. The method of claim 3, further comprising the step of selecting a data classification model for classifying a domain dataset by comparing characteristics of said domain dataset to said rules.

5. The method of claim 1, wherein said domain dataset is represented using a set of meta-features.

6. The method of claim 5, wherein said meta-features includes a concept variation meta-feature.

7. The method of claim 5, wherein said meta-features includes an average weighted

distance meta-feature that measures the density of the distribution of said at least one domain dataset.

8. A method for classifying data, comprising the steps of:

classifying objects in a plurality of domain datasets using one of a number of data classification models, each of said data classification models having a corresponding bias;

evaluating the performance of each of said domain dataset classifications;

maintaining a performance value for each combination of said domain datasets and said bias;

processing said performance values for each combination of said domain datasets and said bias to generate one or more rules, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models; and

selecting a data classification model for classifying a domain dataset by comparing characteristics of said domain dataset to said rules.

9. The method of claim 8, further comprising the step of modifying at least one of said biases based on said performance evaluation.

10. The method of claim 8, wherein said domain dataset is represented using a set of meta-features.

11. The method of claim 10, wherein said meta-features includes a concept variation meta-feature.

12. The method of claim 10, wherein said meta-features includes an average weighted distance meta-feature that measures the density of the distribution of said at least one domain dataset.

13. A method for classifying data in a domain dataset, comprising:

applying an adaptive learning algorithm to said domain dataset to select a data

classification model based on a meta-feature that characterizes said domain data set, said data classification model having a bias;

classifying objects in said domain dataset using said selected data classification model;

evaluating the performance of said classifying step;

maintaining an indication of said performance of said model for said domain dataset;

repeating said applying, classifying and evaluating steps for a plurality of said domain datasets; and

processing said performance values for each combination of said domain datasets and said bias to adjust one or more rules for subsequent data classification, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models.

14. The method of claim 13, further comprising the step of selecting a data classification model for classifying a domain dataset by comparing characteristics of said domain dataset to said rules.

15. The method of claim 13, further comprising the step of modifying at least one of said biases based on said performance evaluation.

16. A system for classifying data, comprising:

a memory that stores computer-readable code; and

a processor operatively coupled to said memory, said processor configured to implement said computer-readable code, said computer-readable code configured to:

classify objects in a domain dataset using ~~a~~ one or more data classification models, each of said one or more data classification models having a bias;

selecting at least one of said one or more data classification models based on a meta-feature that characterizes said domain data set;

evaluate the performance of said classifying step; and

modify said bias based on said performance evaluation.

17. The system of claim 16, wherein said processor is further configured to classify said objects and evaluate said performance for a plurality of said domain datasets and wherein said processor records a performance value for each combination of said domain datasets and said bias.

18. The system of claim 17, wherein said processor is further configured to process said recorded performance values for each combination of said domain datasets and said bias to generate one or more rules, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models.

19. The system of claim 18, wherein said processor is further configured to select a data classification model for classifying a domain dataset by comparing characteristics of said domain dataset to said rules.

20. The system of claim 16, wherein said domain dataset is represented using a set of meta-features.

21. A system for classifying data, comprising:

a memory that stores computer-readable code; and

a processor operatively coupled to said memory, said processor configured to implement said computer-readable code, said computer-readable code configured to:

classify objects in a plurality of domain datasets using one of a number of data classification models, each of said data classification models having a corresponding bias;

evaluate the performance of each of said domain dataset classifications;

maintaining a performance value for each combination of said domain datasets and said bias;

process said performance values for each combination of said domain datasets

and said bias to generate one or more rules, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models; and

select a data classification model for classifying a domain dataset by comparing characteristics of said domain dataset to said rules.

22. An article of manufacture for classifying data, comprising:

a computer readable medium having computer readable code means embodied thereon, said computer readable program code means comprising:

a step to classify objects in a domain dataset using ~~a~~ one or more data classification models, each of said one or more data classification models having a bias;

selecting at least one of said one or more data classification models based on a meta-feature that characterizes said domain data set;

a step to evaluate the performance of said classifying step; and

a step to modify said bias based on said performance evaluation.

23. An article of manufacture for classifying data, comprising:

a computer readable medium having computer readable code means embodied thereon, said computer readable program code means comprising:

a step to classify objects in a plurality of domain datasets using one of a number of data classification models, each of said data classification models having a corresponding bias;

a step to evaluate the performance of each of said domain dataset classifications;

a step to maintaining a performance value for each combination of said domain datasets and said bias;

a step to process said performance values for each combination of said domain datasets and said bias to generate one or more rules, each of said rules specifying one or more characteristics of said domain datasets and a corresponding bias that should be utilized in one of said data classification models; and

a step to select a data classification model for classifying a domain dataset by

comparing characteristics of said domain dataset to said rules.

EVIDENCE APPENDIX

There is no evidence submitted pursuant to § 1.130, 1.131, or 1.132 or entered by the Examiner and relied upon by appellant.

RELATED PROCEEDINGS APPENDIX

There are no known decisions rendered by a court or the Board in any proceeding identified pursuant to paragraph (c)(1)(ii) of 37 CFR 41.37.